

NASA's Space Shuttle was built to withstand multiple failures while still keeping the crew and vehicle safe. Although the design of the Space Shuttle had a great deal of redundancy built into each system, there were often additional ways to keep systems in the best configuration if a failure were to occur. One such method was to use select pieces of hardware in a way for which they were not primarily intended. The primary function of the Heads-Up Display (HUD) was to provide the crew with a display of flight critical information during the entry phase. The primary function of the Crew Optical Alignment Sight (COAS) was to provide the crew an optical alignment capability for rendezvous and docking phases. An alignment device was required to keep the Inertial Measurement Units (IMUs) well aligned for a safe Entry; nominally this alignment device would be the two on-board Star Trackers. However, in the event of a Star Tracker failure, the HUD or COAS could also be used as a backup alignment device, but only if the device had been calibrated beforehand. Once the HUD or COAS was calibrated and verified then it was considered an adequate backup to the Star Trackers for entry IMU alignment. There were procedures in place and the astronauts were trained on how to accurately calibrate the HUD or COAS and how to use them as an alignment device. The calibration procedure for the HUD and COAS had been performed on many Shuttle missions. Many of the first calibrations performed were for data gathering purposes to determine which device was more accurate as a backup alignment device, HUD or COAS. Once this was determined, the following missions would frequently calibrate the HUD in order to be one step closer to having the device ready in case it was needed as a backup alignment device.